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Development of viewer applications of the National Seismic Hazard Maps for smartphones

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1. Introduction

NIED has developed the WWW site to see "National Seismic Hazard Maps for Japan", J-SHIS in 2005. From 2008, a refined interface to view huge amount of hazard map images and data is added to the J-SHIS system by using and asynchronous HTTP request processing with JavaScript, and OpenGIS(R) standards. Higher usability, ubiquity and on-demand information delivery are required so that J-SHIS comes to be seen by more people and contribute to raise awareness of disaster prevention. To solve these issues, we developed a viewer application to view the national seismic hazard maps that runs on smartphones, which are getting popular in recent years.

2. Smartphone

A smartphone is a mobile phone that offers an advanced connectivity with 3G/Wi-Fi networks, higher computing and drawing ability, a full-featured web browser, a larger and finer screen, and touch-panel interfaces. In 2008, the smartphones become extremely popular in the wake of the launch of Apple's iPhone Now in 2011, many smartphones installed Android OS developed by Google Inc. are also released. Behind the spread even more than the usability of the device, a variety of applications are developed using open development environments, and smartphone user can easily download and install them which are distributed in sites called "Store".

3. Application features

Our viewer application allows general users to easily view the latest probabilistic seismic hazard maps, influence maps, and shallow/deep subsurface structure maps, which are all supporting 250m mesh and published with WMS in J-SHIS site. Google maps service is used to display overlaid background maps. The user can select one from three type images, Streets (Street map), Satellite (Aero photo), and Hybrid (Street map over aero photo). Using a transmission changer for a hazard map layer, hazard levels are easily associated with features and landscapes in this application. Smooth map scrolling is controlled by a touch interface. In addition, "Pinch-zoom" is available on a device with multi-touch interface. Location search function like J-SHIS site and realtime GPS tracking are also available. This application is developed for iPhone4 and Android2. They will be downloadable at each store for free.

4. Future development

When walking around with a smartphone installed this application, users would see the hazard maps and the actual landscape at the same time, then they could recognize the hazard information more with a feeling than when looking at them by PC on the desk. Studies will be made in the future on development of more immersive interface and information delivery by using AR (Augmented Reality) technology, for example, displaying meshed hazard information or information collected by social media on live-view image of smartphone. In addition, multi-hazard or risk information might be distributed on the same system. Therefore, the construction of hazard/risk information database further, interoperability of services as diverse as the various social media, and frequent and high precision positioning are required. The development of application will be made in parallel with growth of J-SHIS beyond infrastructure systems.

Keywords: Seismic Hazard Map, J-SHIS, Smartphone, IT, Positioning system